REMARKS/ARGUMENTS

Claims 1-13 and 15-27 are pending in this application. Claims 1-14 and 17-24 are rejected, and claims 15 and 16 are objected to. Claims 25-27 stand withdrawn from examination. Reexamination and reconsideration of this Application, withdrawal of the rejections, and formal notification of the allowability of all claims as now presented are earnestly solicited in light of the above amendments and the remarks that follow.

Claim 1 has been amended to define the carboxylate esters as having the formula -O-$(CH_2)_r$-CO_2-, wherein r is 1-10. Support for this addition may be found throughout the specification, and particularly on the last line of page 10.

In order to expedite prosecution, reference to oligonucleotides and peptides has been removed from claims 1, 10-12, and 22. Claims 14, 17, and 18 have been cancelled without prejudice or disclaimer. Claim 15 has been rewritten into independent form. A definition for the R moiety has been added to claims 20 and 21 and a definition for the W moiety has been added to claim 21.

Other minor amendments to the claims are also presented herein, including deletion of redundant terminology, including the term "in aqueous solution" from claims 2 and 3 and the term "adjacent to said hydrolytically unstable linkages" from claim 5. Claim 4 has been amended to refer to hydrolyzable linkages. Claim 16 has been amended to correct typographical errors. No new matter has been introduced through these amendments.

The Examiner has rejected claims 1-9, 17-18, and 23-24 under 35 U.S.C. §112, first paragraph, stating that although these claims are written to encompass any PEG-based structures with some hydrolytically unstable linkages, the specification does not provide chemical structural information for these structures. Applicants respectfully submit that the claim as written meets the written description requirement. Claim 1 recites a crosslinked polymeric structure wherein PEG polymers are crosslinked via any of the listed hydrolysable linkages. One of skill in the art would be aware that PEG polymers do not themselves comprise any hydrolytically unstable linkages. Accordingly, there must be portions in the crosslinked polymeric structure that connect the PEG polymers. It would be obvious to one of skill in the art

that the hydrolytically unstable linkages would occur in the portions of the polymeric structure connecting adjacent PEG units. Applicants respectfully submit that based on the general knowledge of one of skill in the art and the disclosure in the specification, one of skill in the art would readily understand the range of polymeric structures encompassed by Claim 1.

Furthermore, numerous recent patent applications include claims relating to "crosslinked polymers" generally, which are understood to those of skill in the art. For example, U.S. Patent No. 7,473,719 to Plaut et al. claims a "process for making a substrate bearing a coating of a ***crosslinked polymer*** composition on at least one surface thereof, comprising the steps of: a) coating onto said substrate a polymer composition comprising i) a first component polymer comprising a plurality of polymerized monomer units derived from an ethylenically unsaturated monomer having pendent hydrophilic groups, and a plurality of polymerized monomer units derived from an ethylenically unsaturated monomer having pendent Michael donor groups; and ii) a crosslinking agent comprising at least two Michael acceptor groups, and iii) optionally a monoacryl component; and b) crosslinking said first component polymer and crosslinking agent, in the presence of a basic catalyst." U.S. Patent No. 7,449,605 to Chang et al. (2008) claims "The pharmaceutical composition of claim 1 [A pharmaceutical composition comprising core-shell particles and a pharmaceutically acceptable excipient, said core-shell particles including a polymeric particle core microencapsulated in a polymeric shell, the polymeric particle core comprising crosslinked amine moieties, the polymeric shell comprising pendant acid groups], wherein the shell comprises a ***crosslinked polymer***. The phrase "crosslinked polymer" is sufficient in these cited patents and others to describe the claimed materials to one of skill in the art. Note that the precise structure of the claimed polymer is not provided in these patents. It is customary to claim a polymeric material by reference to its polymer components and linkages without setting forth the complete structure, which is unnecessary in order for one of skill in the art to understand the scope of the claim. Applicants respectfully submit that claim 1 as amended and those claims that are dependent on claim 1 are clearly allowable as written.

The Examiner has rejected claims 1-6, 9-10, and 23-24 under 35 U.S.C. §112, first paragraph, stating that although these claims are directed to materials with hydrolytically unstable linkages, which encompass all peptides and oligonucleotides, the specification does not

disclose examples or descriptions of any peptides or oligonucleotides that are encompassed by the invention. Applicants respectfully disagree; however, in order to expedite prosecution, Applicants have removed references to peptides and oligonucleotides in the claims. Applicants respectfully submit that these claims are now in a position for allowance.

The Examiner has rejected claim 20 under 35 U.S.C. §112, second paragraph as being vague and indefinite for failing to provide a definition for "R." The Examiner has also rejected claim 21 under 35 U.S.C. §112, second paragraph as being vague and indefinite for failing to provide a definition for "R" and "W." A definition for the variable R is now included in claims 20 and 21 as amended and a definition for the variable W is now included in claim 21. Applicants respectfully submit that no new matter has been introduced by way of these amendments, as definitions for both R and W is found throughout the specification, and in claim 10 as filed. Applicants respectfully submit that these definitions render claims 20 and 21 definite, and respectfully submit that the claims are now in a position for allowance.

The Examiner has rejected claims 1, 10-12, and 22 under 35 U.S.C. §112, second paragraph, indicating that although claim 1 recites a polymeric structure comprising PEG polymers in the absence of non-PEG polymers, these claims recite various non-PEG polymeric components that make up the claimed structure. Applicants respectfully disagree with this rejection; however, in order to expedite prosecution, the claims have been amended to delete references to oligonucleotides and peptides. However, Applicants respectfully submit that glycerol oligomers are not polymers and therefore, claims 11 and 22 are not vague for indicating that glycerol oligomers may be a component of the polymeric structure when non-PEG polymers are expressly excluded from the structure. One of skill in the art would readily understand an oligomer to be a chemical structure with a limited number of repeat units, whereas polymers are understood to contain more repeat units. The terms oligomer and polymer are well understood by one of skill in the art to refer to different materials. In fact, various scientific articles as well as numerous patents refer to oligomers and polymers as independent materials (e.g., U.S. Patent No. 6,815,469, entitled "Biodegradable, injectable oligomer-polymer composition"; U.S. Patent No. 7,198,878, entitled "Aqueous developable, photosensitive benzocyclobutene-based oligomers and polymers with high moisture resistance"). Applicants respectfully submit that

these references, among others, indicate that one of skill in the art would view oligomers as separate from polymers. As a result, Applicants respectfully submit that these claims are now in a position for allowance.

Claim 1 is additionally rejected under 35 U.S.C. §112, second paragraph, as being vague and indefinite for its reference to at least "some" hydrolytically unstable linkages. Applicants respectfully disagree and respectfully submit that the term "some" as used in claim 1 is not vague. The term "some" would be readily understood by one of skill in the art as the number of linkages sufficient to allow degradation of the polymeric structure. The specification indicates, on page 5, the process by which the hydrolytically unstable linkages are introduced into the material. As an example, page 5 depicts 2 PEGs with different terminal groups (PEG-Z and Y-PEG), reacting to form PEG-W-PEG (having at least one hydrolytically unstable linkage, W). As another example, the specification on page 6 shows carboxylic acid-terminated PEG reacted with a 3-armed alcohol-terminated PEG (forming a material with at least three hydrolytically unstable linkages). One of skill in the art would realize that the number of hydrolytically unstable linkages in the final product, formed by reaction of the end groups of these reactants, is dependent on the type and amount of reactants used and the size of the PEG units therein. Based on the knowledge of one skilled in the art and on this disclosure regarding the preparation of the claimed materials, one of skill in the art would readily understand the meaning of the word "some" in claim 1, and would accordingly understand the range of polymeric structures encompassed by claim 1.

Claims 1-10, 12-13, 17-19, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,648,506 to Desai et al. The Examiner asserts that Desai teaches that taxol can be linked to PEG via either hydrolytically unstable ester linkages and hydrolytically stable urethane linkages. Consequently, the Examiner argues that it would have been obvious to one of ordinary skill in the art to use a glycerol oligomer as a core for branching PEG chains, to which taxol or other drugs may be attached via hydrolytically unstable ester linkages. Applicants respectfully traverse this rejection.

To establish a *prima facie* case of obviousness, according to a test predominately used by the courts, three basic criteria must be met. First, there must be some suggestion or motivation,

either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim elements. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck,* 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

With regard to the Supreme Court's decision in *KSR Int'l. Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007), it is noted that the Court did not dismiss the usefulness the well-established "teaching, suggestion, or motivation" test set forth above, but merely cautioned against its rigid application. The Supreme Court in *KSR* commented that the Federal Circuit "no doubt has applied the test in accord with these principles [set forth in *KSR*] in many cases." *Id.* 82 USPQ2d at 1396. However, the Supreme Court also opined that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. . ." *Id.* 82 USPQ2d at 1395-96. Regardless of the precise test used, the Court, quoting *In re Kahn*, cautioned that " '[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.' " *Id.* 82 USPQ2d at 1396.

Applicants believe that the Examiner is in error in her comparison between Desai and the present invention, as the polymers disclosed in Desai and those claimed in the present invention are fundamentally different. First, where the materials taught by Desai contain degradable linkages, these hydrolyzable linking groups are attached to the PEG-based materials to allow for hydrolysis of the drug-polymer conjugate prior to delivery of the drug to separate the drug from the polymeric carrier. Accordingly, upon hydrolysis, the attached drug may be cleaved from the PEG-based carrier. In contrast, the hydrolytically unstable linkages referred to in the present specification and claims are present in the backbone of the polymeric materials, and are included therein to provide not only for release of the drug, but also for hydrolytic degradation of the crosslinked polymeric material (page 5, paragraph 23). Degradation of the crosslinks allows for the breakdown of the polymeric delivery agent into smaller PEG fragments that may be easily

cleared from the body. This critical feature is not taught or suggested by Desai. This feature of the chemical structure is apparent in amended claim 1, wherein the PEG chains are connected by hydrolytically unstable linkages (esters, imines, hydrazones, acetals, or orthoesters). Because Desai does not contain any mention of hydrolytically unstable linkages between the PEG components, Applicants respectfully requests reconsideration and withdrawal of all rejections relying on this reference.

Furthermore, the polymers of Desai are prepared via free radical polymerization. For example, see column 8, lines 19-26, wherein Desai describes the preparation of crosslinked materials, comprising isolating a branched or star PEG with a portion of the available sites functionalized by acrylate or methacrylate groups and crosslinking by a free radical process that may be thermally initiated or photoinitiated. In contrast, claim 1 of the present invention specifically states that the claimed crosslinked polymeric structure is crosslinked in the absence of photopholymerization or free radical polymerization. For this additional reason, Applicants request reconsideration and withdrawal of this rejection.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

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